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SOME WESTERN ANTHOPHORID AND NOMIINE BEES

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Types of the new forms described herein will be found in The American Museum of Natural History. I give a key to the forms of *Anthophora* falling under 6, Group E, Series I in Cockerell's table (1906).

1.—Hair of face all black ..... *simillima californiensis* Michener.
Hair of face mostly pale ..... 2.

2.—Hair of hind basitarsi entirely black on outer side ..... 3.
Hair of hind basitarsi white, at least at base ..... 4.

3.—Clypeus dull, finely rugose; smaller species ..... *edwardsii* Cresson.
Clypeus shiny, more coarsely rugose; large species.
chlorops utahensis Michener.

4.—Hair of face below antennae entirely light ..... 5.
Hair of face below antennae with black intermixed, at least on lower sides of face near clypeus ..... 7.

5.—Abdomen with only a very few black hairs intermixed among the pale; clypeus with a broad impunctate polished area in the middle ..... *forbesi* Cockerell.
Abdomen with abundant short black hair on dorsum of fourth tergite and elsewhere; clypeus punctured throughout ..... 6.

6.—Tegulae pale brown; second tergite with short dark hair on posterior half medially ..... *lesquerellae* Cockerell.
Tegulae black; second tergite with white hair except sometimes a few dark hairs on posterior margin ..... *gohrmanae* Cockerell.

7.—Hair of dorsum of third tergite almost entirely pale, of following tergite pale with black intermixed; sides of face with but little black hair.
gohrmanae coloradensis Michener.
Dorsum of third tergite with some black hairs; hair of fourth tergite largely black ..... 8.

8.—Outer side of fore and middle tibiae black-haired except for small pale spots at apices, or middle tibiae with some of hairs pale in certain lights; abdomen bluish; large species ..... *pacifica* Cresson.
Outer side of fore and middle tibiae largely pale-haired; abdomen black or hardly bluish ..... 9.

9.—Hairs of outer side of middle and hind basitarsi white ..... *subignava* Cockerell.
Hairs of outer side of middle basitarsus black, of hind basitarsus black apically. 10.

10.—Tegulae black or dark brown; clypeus with a somewhat irregular median longitudinal impunctate band ..... *simillima* Cresson.
Tegulae pale brown or testaceous; clypeus without such a band ..... 11.

11.—Vertex with a broad band of black hair connecting the upper ends of the eyes and going just behind the ocelli ..... *chlorops* Michener.

This band broadly broken by white (sometimes a few black hairs among the white) ..... *porterae* Cockerell.

Anthophora forbesi Cockerell probably falls in another group of Cockerell's key (1906), as it has rather distinct abdominal bands. *A. ignava* Cresson is the female of *A. pacifica* Cresson, as stated by C. Fowler long ago. The Michener species mentioned above but not described herein have been sent for publication elsewhere.

Anthophora chlorops utahensis, new subspecies

FEMALE.—Similar to *A. pacifica* Cresson but hair of hind metatarsi black exteriorly; abdomen not bluish; pale hairs of sternites confined to extreme sides; tegulae margined with red on outer side; eyes (dried specimen) brown; head (in shape) and hind tibial spurs as in *A. chlorops* Michener.

Eureka, Utah, May 24, 1920 (Tom Spalding).

Anthophora simillima Cresson

Camp Roosevelt, Yellowstone Park, Wyoming, July 14–17, 1922 (Lutz).

Anthophora neomexicana Cockerell

Plainview, Jefferson County, Colorado, July 9–14, 1922, elevation 7000–8000 feet (Engelhardt).

Anthophora montana Cresson

White Rocks, near Boulder, Colorado, at *Cleome serrulata*, July 30, 1922, about 5500 feet elevation (Lutz); Eldorado Springs, Colorado, June 23, 1918 (L. O. Jackson).

Anthophora occidentalis Cresson

Regnier, Colorado; Bryce Canyon, Utah, March 10, 1931 (I. Wilson).

Anthophora edwardsii Cresson

Eureka, Utah, June 14, 1920 (Tom Spalding); Altadena, California, February 16, 1935, on *Buddleia* (Michener); Puddingstone Canyon, San Jose Hills, Los Angeles County, California, April 8, 1934 (Michener); Arvin, California, April 6, 1935, on *Amsinckia douglasiana* (Michener).

Anthophora urbana Cresson

Claremont and mountains near Claremont, California (Metz); Fort Hall, near Blackfoot, Idaho, August 27, 1934 (Louise Ireland).

Anthophora walshii Cresson

White Rocks, near Boulder, Colorado, at *Cleome serrulata*, July 30, 1922, about 5500 feet elevation (Lutz).

Emphoropsis mucida ventralis, new variety

FEMALE.—Similar to *E. mucida* Cresson but scopa rather shining brown; hair of lower half of pleura, of venter of thorax, and many of hairs of cheeks blackish brown; hair of sternites black medially; hair on middle of apical margin of fifth tergite reddish.

Rawlins, Wyoming, June 26, 1920, about 41° 47′ N., 107° 15′ W., 6800 feet elevation (Lutz).

In some respects this resembles *E. murihirta* Cockerell but the latter species has many black hairs on scutum, etc.

A specimen of *E. mucida* from Cheyenne Pass, Wyoming, June 13, 1920, 41° 15′ N., 105° 28′ W., 8500 feet elevation, has dark hair on under side of thorax, thus approaching the form *ventralis*.

Emphoropsis mucida (Cresson)

Julesburg, Colorado, June 7, 1920, about 40° 59′ N., 102° 15′ W., 3460 feet elevation (Lutz). This specimen is unusual in having a white scopa and hairs of cheeks not mixed with black. A female from Cheyenne Pass (not the one recorded above under *E. mucida ventralis*, but with the same data as that individual) has several black hairs on dorsum of thorax, and the apex of the fourth tergite has some appressed white hair. In both of these characters it approaches *E. johnsoni* (Cockerell), which has a short white band at apex of fourth tergite. A specimen from Florissant, Colorado (previously recorded by Cockerell), has the scopa practically as yellow as in *johnsoni*.

A male from Apex Canyon, Boulder, Colorado, May 1, 1921 (L. O. Jackson), is apparently the male of *E. mucida*. The finding of a male for *mucida* (other than *E. morrisoni* (Cresson), which is probably distinct), makes it possible to consider *johnsoni* Cockerell a variety of *mucida* as was originally done. There seems to be too much variation and intergradation to consider them distinct species. *E. mucida* (male) differs from *E. mucida johnsoni* Cockerell (male) as follows: scape with a yellow line on basal half only; lateral face marks smaller, leaving a wider gap between them and yellow of clypeus; tergites three to five with considerable pale hair.

Diadasia diminuta (Cresson)

Denver, Colorado, June 18, 1918, on *Malvestrum coccineum* (L. O. Jackson).

Diadasia australis (Cresson)

Aurora, Colorado, June 22, 1918 (L. O. Jackson); South Table Mountain, Golden, Colorado, June 20, 1918 (L. O. Jackson); Colorado Springs, Colorado, 6000–7000 feet elevation, June 15–30, 1896 (H. F. Wickham).

Diadasia enavata (Cresson)

Salt Lake City, Utah, about 40° 45′ N., 111° 45′ W., 5000 feet elevation, July 28, 1920, in sunflowers in early rainy morning (Lutz).

Melitoma grisella (Cockerell and Porter)

Regnier, Colorado.

Nomia tetrazonata Cockerell

I refer a female from Florence Junction, Arizona, June 15, 1934 (M. and H. James), to this species. It is similar to the male but stigma darker; antennae black; legs mainly black. Evidently close to *N. foxii* Dalla Torre (which I have not seen), differing, to judge by notes under the description of *tetrazonata*, by the large punctures of third tergite, those of fourth being not very much smaller. This is as in *N. universitatis* Cockerell, which is larger, with more coarsely punctate pleura, vertex, etc. In *universitatis* the punctures of the basal part of the fourth tergite are smaller than those of the more sparsely punctate apical area of this tergite. In *N. tetrazonata* the punctures of the base of the fourth tergite are of the same size as, merely closer than, those of rest of tergite.

Nomia californica Cockerell

Fort Hill, July 21, 1934, and Mill Creek, August 30, 1934, both near Blackfoot, Idaho (Louise Ireland).